An Efficient Algorithm for the 3D–Reconstruction and Reproduction in Cultural Heritage

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ABSTRACT

In this paper the conception and realization of a hardware independent modular software system will be discussed. This can be used for the processing of data that were generated by different digitizing systems in various topics of Cultural Heritage. In addition to this, the algorithm will not only calculate the external 3D contour of an object but also the internal geometric structure, if the information is given (for example x-rays of mummies). In engineering terms, the combination of the internal and the external geometric structure of an object is defined as the so called volume or solid structure. With the support of this algorithm, the reconstruction of artifacts, monuments and archaeological sites can be efficient. The algorithm enables experts to quickly analyze and/or monitor the damage caused to the object throughout time. Moreover, the documentation of the 3Dreconstructed object is fast and powerful as well as the computer aided restoration. Furthermore, the developed system can give out the 3D reconstructed data sets of an object in standard data exchange formats (IGES, STEP, VDAFS) for their further processing and reproduction. A finite element simulation analysis of the 3D reconstructed object can also be achieved.

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